

Training Package for the Operation of the Met One E-BAM Mass Monitor and AIRSIS Remote Satellite Telemetry System for Emergency Air Monitoring During Wildfires

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Training Package Outline

1. Project Background
2. E-BAM Mass Monitor
3. AIRSIS Remote Satellite Telemetry System
4. AIRNow-Tech (EPA and Sonoma Technology)
5. E-BAM Inventory and Stakeholder Contact List
6. Additional Reading Materials
7. Supporting Documentation

1. Project Background

Topics covered in this section:

- Background
- Benefits
- Overview and Purpose
- Project Design
- Current Stakeholders
- Project Timeline
- Progress to Date

Background

- Fine particulate matter (PM_{2.5}) has been widely linked to adverse health effects, and as such has been the target of air quality monitoring for a number of years.
- Approximately 70% of the particulate mass generated from wildfires is less than 2.5 microns in diameter, making it an optimum size to be carried deep into the respiratory system.
- Past fire seasons have resulted in numerous instances where wildfire-generated particulate concentrations have largely exceeded public health and air quality standards.
- Limited monitoring has been conducted to assess the impacts of PM_{2.5} from wildfires on air quality and human health.

Background (*contd.*)

- A lack of appropriate monitoring guidance and protocols has resulted in collection of relatively sparse or incomplete monitoring data during wildfire episodes, hampering the ability of air quality and health agencies to make informed decisions and adequately protect the public.
- Wildfires present unique challenges to air quality and health agencies:
 - Size and intensity of fires can vary based on fuel types/availability, weather conditions, and topography.
 - Events can last from hours to months, dispersing pollutants that have the potential to travel great distances.

Background (*contd.*)

- Monitoring efforts during wildfire episodes may require rapid response and deployment of instrumentation at locations that likely would be removed from sites where traditional air monitoring activities are conducted.
- Determining the real-time airborne concentrations of smoke particulate matter is very important to land managers and air quality specialists who need reliable methods to measure particulate concentrations.
- Real-time instruments could provide more timely and frequent information for more detailed smoke advisories and health warnings to local area residents.

Benefits

- Federal, state, and local agencies will be better prepared to provide decision makers and the public timely and reliable information on short-term air quality impacts of PM_{2.5} produced by wildfires. Methods can be extended in the future to other emissions such as air toxics.
- Monitoring data can be used to validate emissions transport/deposition models and support development of wildfire emissions factors.

Overview and Purpose

- EPA in cooperation with other organizations has developed a project to address the need for wildfire emissions monitoring and data reporting guidance.
- Develop consistent fine particulate matter monitoring guidance and protocols that can be applied by EPA, state/local agencies, and federal land management (FLM) agencies during wildfire emergency air monitoring episodes.
- Provide appropriate monitoring data to better support public health advisories on the effects of wildfire smoke.

Project Design

- Establish stakeholder group to share current approaches and build consensus on essential minimum needs and requirements for instrumentation, quality assurance, reporting, logistics, and staffing.
 - Stakeholder group consists of state/local agencies, FLMs, and EPA whose members are currently responsible for providing wildfire air monitoring data, and who would disseminate knowledge and seek to build consensus on essential needs and requirements.
- Enable state/local agencies have worked with EPA and FLMs to develop/receive training on appropriate portable fine particulate matter monitors and gain operational experience in the use of the monitors sited at existing National Air Monitoring/State/Local Air Monitoring Stations (NAMS/SLAMS) sites.

Project Design (*contd.*)

- Formulate a basic set of operational protocols for deploying the portable fine PM monitors during wildfire events and incorporate remote data satellite telemetry technology for rapid reporting.
- Address additional issues: assess future potential for monitoring toxics; public access to real-time monitoring data (AIRNow); and interaction between states, EPA, and the FLMs during emergency events.
- Consolidate experience feedback from trial deployments and recommend draft final protocols for nationwide application.

Current Stakeholders

- Current stakeholder group consists of approximately 60 members.
 - States:
 - Alaska
 - Arizona
 - California
 - Colorado
 - Idaho
 - Montana
 - Nevada
 - New Mexico
 - Oregon
 - Washington
 - FLMs:
 - Bureau of Land Management
 - National Park Service
 - Fish and Wildlife Service
 - Forest Service
 - EPA:
 - Region 6
 - Region 8
 - Region 9
 - Region 10
 - RTP

Project Timeline

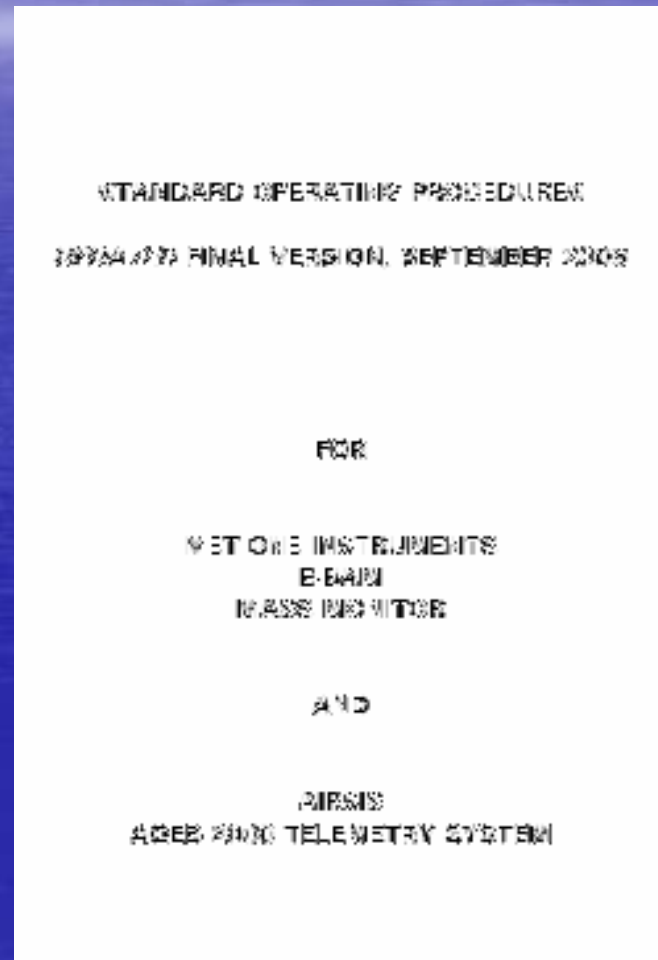
- FY04 - EPA provided funds for purchase of 9 portable monitors in the Western United States.
 - Two collocated in AZ and one in each of the following states – AK, CA, CO, MT, NM, OR, and WA.
 - Fish and Wildlife purchased 2 portable monitors.
- Contractor support for document preparation support.

Project Timeline (*contd.*)

- FY05 - EPA purchased portable data telemetry systems to be used to uplink monitors with EPA/AIRNow websites.
- Purchased E-BAMs for NV and ID.
- Contractor support for development of operational SOP and smoke monitor comparison study with PM_{2.5} FRM data comparisons at national air monitoring sites.

Supporting Documentation (Located in this Training Package)

- This is commonly referred to as the **operational SOP** and is referenced in the Met One and AIRSIS sections that follow.



Supporting Documentation (Located in this Training Package)

**Revised Draft Technical Report
on
Analysis of E-BAMS/FRMS Intercomparisons at NAMS Sites
Work Assignment 3-13, Task 3**

1.0 BACKGROUND AND PURPOSE

Monitoring smoke particulate matter (PM) concentrations from prescribed burns and wildland fires is becoming increasingly important. Smoke particles, whether from prescribed burning or natural wildfire, are generally smaller than 2.5 micrometers and pose a potential health threat to individuals, especially those with respiratory problems. These fine particles (PM_{2.5}) also pose potential visibility, safety, and nuisance problems at certain concentrations.

A lack of appropriate monitoring guidance and protocols has resulted in collection of relatively sparse or incomplete monitoring data during wildfire episodes for air quality and health agencies to make informed decisions and adequately protect the public. Monitoring efforts needed by health officials during wildfire episodes may require rapid response and deployment of instrumentation at locations that most likely would be removed from the traditional National Air Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS) where routine National Ambient Air Quality Standard (NAAQS) monitoring activities are conducted. Determining the airborne concentrations of smoke particulate matter is very important to land managers and air quality specialists who need reliable methods to measure particulate concentrations. Furthermore, rapid or real-time measurement of PM_{2.5} could provide more timely and frequent information for more detailed smoke advisories and health warnings to local area residents. However, there are few monitors that provide rapid measurements of PM_{2.5} and can be rapidly deployed to potentially remote locations for wildfire monitoring.

Progress to Date

- Stakeholder group agreed to project plan, resources, and schedule.
- Communication via conference calls.
- Consensus reached on monitoring technology to be used during comparative assessments and field deployment trials.
 - Met One's portable E-BAM
- Monitors (12) and satellite modems (13) ordered and installed by states at fixed sites for intercomparison study.

Progress To Date (*contd.*)

- E-BAM operational SOP available to operators – full and abridged version.
- E-BAM training and study planning meeting held with stakeholders in January 2005.
- Satellite modem data telemetry systems activated and data link with AIRNow-Tech established.

Progress To Date (*contd.*)

- FY06 - Contractor support to draft final recommended SOPs.
- Future training sessions in other parts of the country anticipated.

2. E-BAM Mass Monitor

Topics covered in this section:

- Background
- Theory of Operation
- Mass Measurement
- E-BAM Advantages
- Installation
- Operation
- Self Test
- Calibration
- Troubleshooting Guide
- Maintenance
- Data Retrieval
- E-BAM User Assistance

Background

- Manufactured by Met One Instruments

Corporate Sales & Service:

1600 Washington Blvd.

Grants Pass, OR 97526

Phone 541/471-7111

Fax 541/471-7116

<http://www.metone.com/particulate.htm>



Background

- Beta gauges are a time proven technology; they have been in use for over 50 years.
- Beta attenuation has demonstrated superior accuracy compared to other popular methods.
- Beta attenuation technique is simpler, easier to use than other popular methods.

Background

Beta Gauge Advantages

- No make up gas required.
- Technology is “stable”.
- Filter replacement is needed only once every two months under routine operating conditions.
 - Fewer site trips required
- Excellent accuracy compared to manual gravimetric technique.

Theory of Operation

- Beta rays are measured across clean filter tape. The measured value – I_0
- Air containing particulate matter is sampled and deposited on the filter tape.
- Beta rays are measured across dirty filter tape. The measured value – I

Beta Attenuation Mass Measurement

- Defined as a decrease in the number of beta particles (^{14}C source) due to absorption by the traversed medium.
- Operationally, $\text{PM}_{2.5}$ aerosols are collected on a filter paper strip, and the difference in beta attenuation between an air sample filter and a blank filter are related to the mass weight in the sample and used with the air volume collected to produce a mass per unit volume.

Mass Calculation

$$I = I_0 e^{-\mu x}$$

$$x = -\frac{1}{\mu} \ln\left(\frac{I}{I_0}\right)$$

$$C = \frac{Ax}{V}$$

Mass Calculation

- DEFINITIONS:

- I – beta measurement across clean filter
- I_0 – beta ray measurement across dirty filter
- μ – calibration coefficient ($\text{m}^2/\mu\text{g}$)
- x – mass density on filter tape ($\mu\text{g}/\text{m}^2$)
- A – dust spot deposition area on filter tape (m^2)
- V – sampled volume (m^3)
- C – particulate matter concentration ($\mu\text{g}/\text{m}^3$)

E-BAM Advantages

- Portable real-time beta gauge traceable to US-EPA requirements for automated PM_{2.5} and PM₁₀ measurement.
- Continuously samples and measures ambient air for particulate matter.
- Lightweight and rugged, may be easily mounted on a tripod in a matter of minutes.
- Will operate on either AC or DC power. Battery and solar operation available.

E-BAM Advantages

- Principle of operation is the same as BAM-1020 – a designated method.
- Superior accuracy compared to particulate monitors based upon light scatter.
- E-BAM, like other beta gauges is based upon mature technology.
- Equipment is simple, easy to operate.

E-BAM Installation

- Refer to Section 2.0 of Operational SOP
 - List of Tools and Supplies
 - E-BAM Components
 - Assembly: Physical and Software Setup

List of Tools and Supplies

- Allen wrench
- Adjustable wrench
- Phillips head screw driver
- Pliers
- Wire cutters
- Hex key set
- NIST-traceable flow audit device
- NIST-traceable temperature standard
- NIST-traceable barometric pressure standard for calibrations and/or audits.

E-BAM Parts List

- ✓ E-BAM Console
- ✓ ambient temperature probe
- ✓ inlet adaptor tube
- ✓ tripod
- ✓ communication cable
- ✓ filter tape, 1 roll
- ✓ E-BAM operation manual
- ✓ PM₁₀ head (BX-802)
- ✓ cross arm support
- ✓ external power cable
- ✓ zero calibration plate
- ✓ span calibration plate
- ✓ E-BAM calibration sheet

Standard E-BAM Components*

Cross Arm Support



E-BAM Enclosure



Filter Tape, 1 Roll



*Shipped with Unit

Standard E-BAM Components (*contd.*)

PM₁₀ Head



Inlet Tube



Tripod



Standard E-BAM Components (*contd.*)

Ambient
Temperature



Zero Calibration
Plate



Power Cable



Standard E-BAM Components (*contd.*)

Communication
Cable

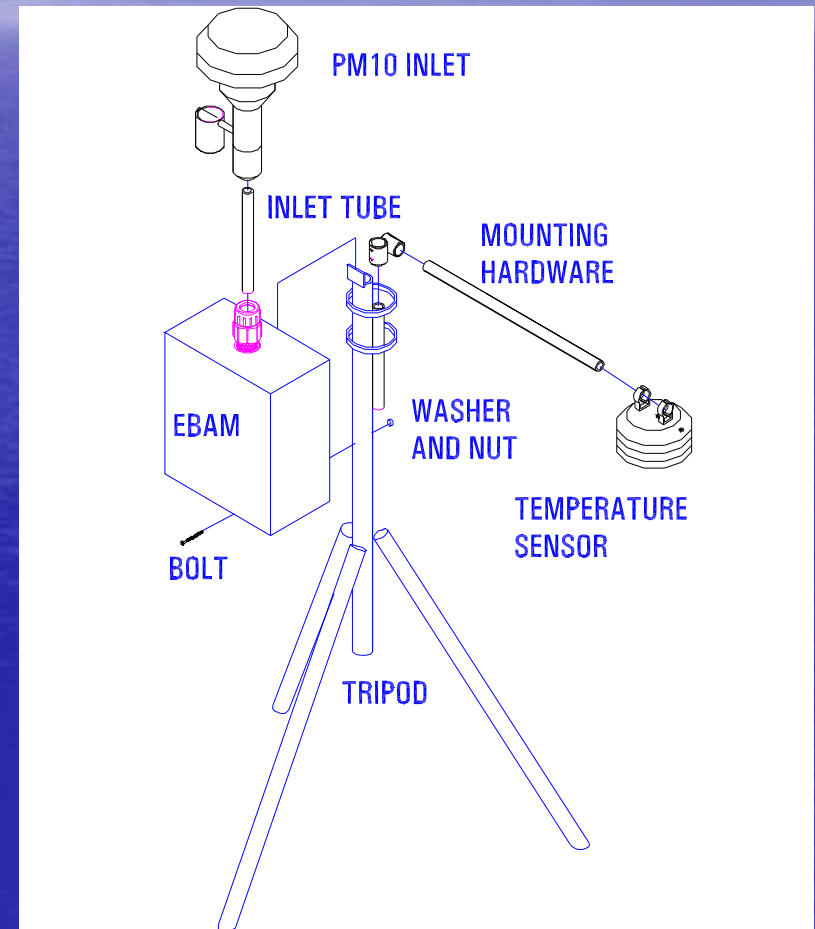


Span Calibration
Plate



Physical Setup

- Review Section 2.4 of operational SOP for complete instructions:
 - Assemble Tripod
 - Install E-BAM cabinet
 - Install E-BAM inlet adaptor tube
 - Install PM_{2.5} and PM₁₀ inlet
 - Install cross arm and temperature sensors
 - Connect the power source



E-BAM Parts List (Optional)

- ✓ PM_{2.5} sharp cut cyclone (SCC) (BX-807)
- ✓ total suspended particulate (TSP) sampling head
- ✓ BX-305 flow test inlet valve
- ✓ battery 12 Volt DC
- ✓ battery charger
- ✓ AC power module

E-BAM Options

BX-305 Flow
Test Inlet Valve



PM_{2.5} Sharp Cut
Cyclone



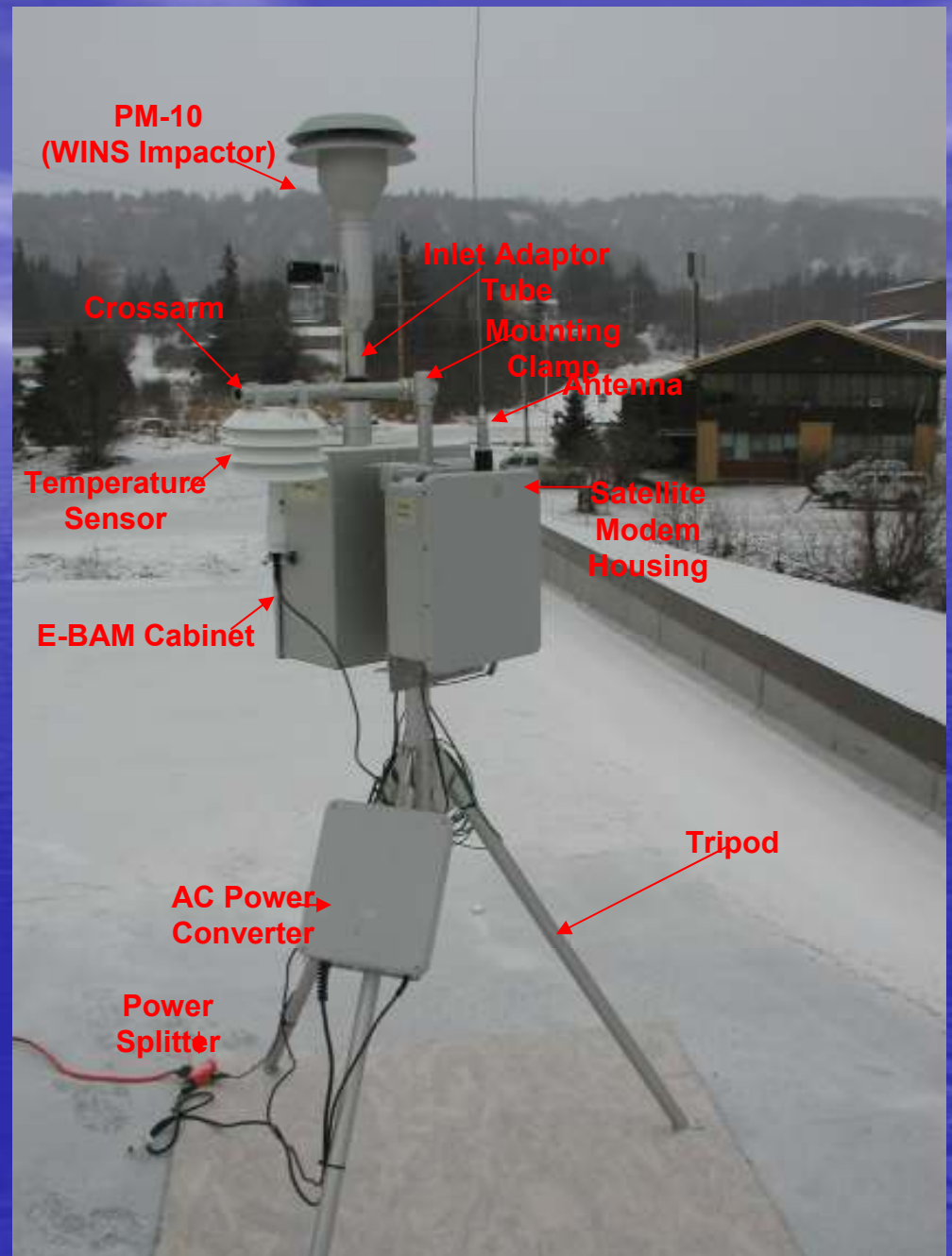
AC Power
Module



Physical Setup

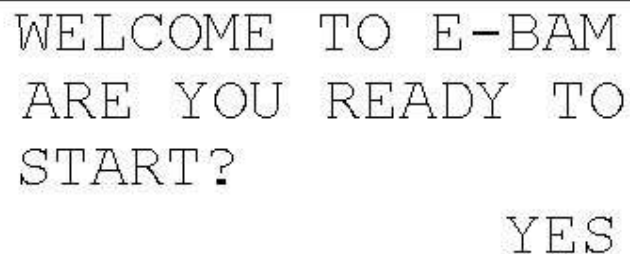
- E-BAM can be taken out of the box, assembled, and be collecting data in less than 30 minutes!
- When power is applied to the E-BAM, it will operate after certain set-up instructions are answered. If the set-up instructions are not answered, the E-BAM will use default answers and begin operation automatically after 30 minutes.

E-BAM Set-up



Software Setup

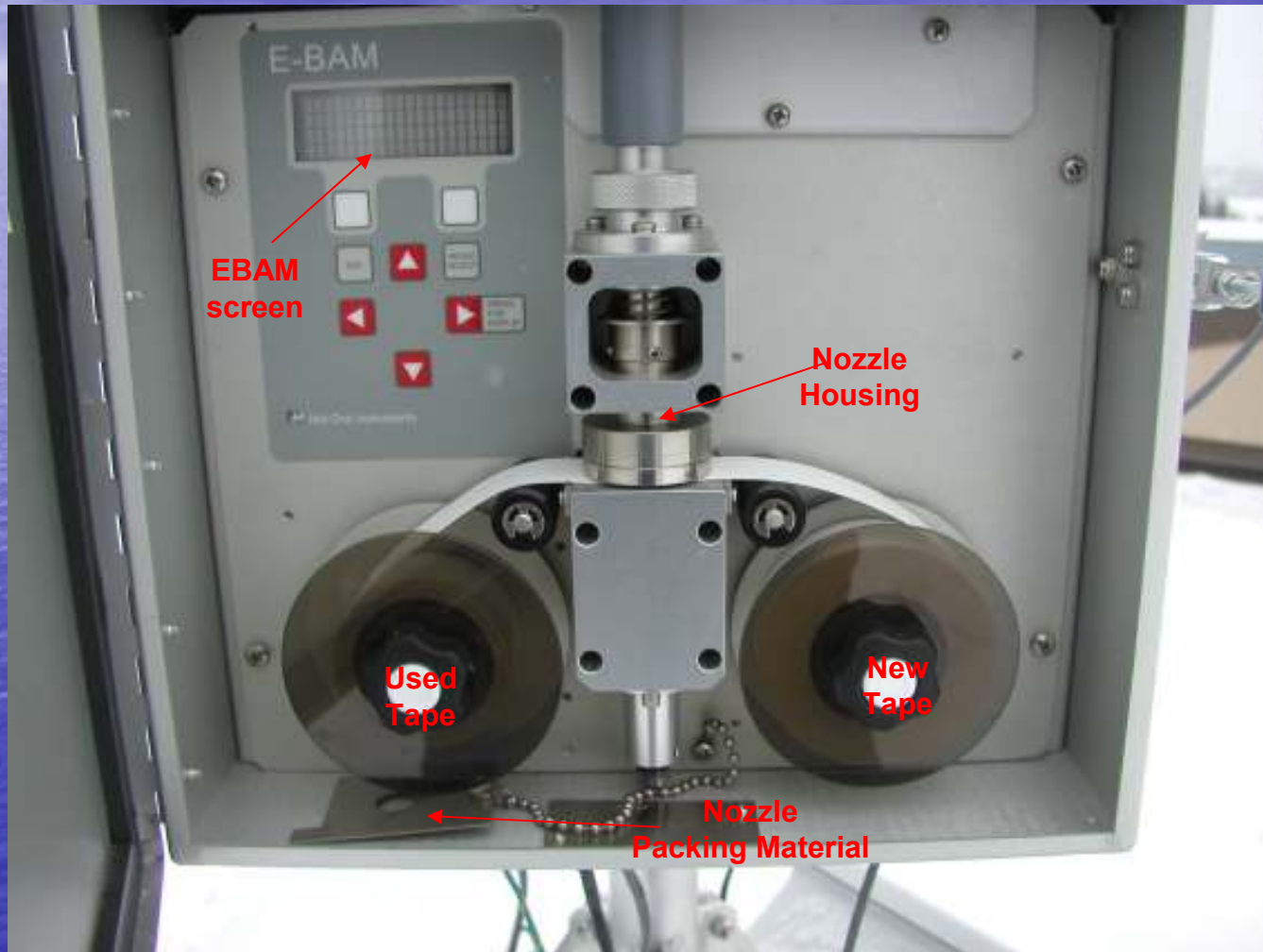
- The following screen will appear when the E-BAM is first powered up:

A screenshot of a software setup screen for E-BAM. The screen is white with a black border. It contains the text "WELCOME TO E-BAM" on the first line, "ARE YOU READY TO" on the second line, and "START?" on the third line. Below the question, the word "YES" is displayed on the right side.

WELCOME TO E-BAM
ARE YOU READY TO
START?
YES

- Press the white "soft" key under YES to proceed.

E-BAM Tape Drive and Inlet/Sensor



Software Setup

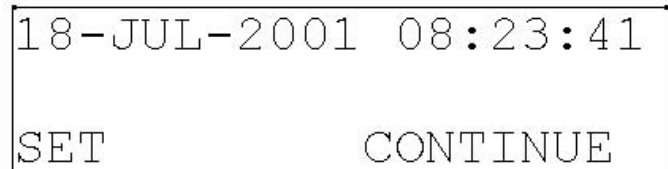
- Followed by:

```
DATE: 18-JUL-2001  
TIME: 08:41:45  
IS THIS CORRECT?  
NO                      YES
```

- Select “NO” if time needs to be changed, otherwise select “YES”.
- If using the AIRSIS satellite system, the time should be in Greenwich Mean Time (GMT), **not** local time.

Software Setup

- If time needs to be changed (“NO” selected), the following screen appears”.



18-JUL-2001 08:23:41
SET CONTINUE

- Use arrow keys to make changes if needed, click “SET” to save, or “CONTINUE” to exit without saving.

Software Setup

- The next screen is the E-BAM location, tape advance, and averaging start-up screen.

LOCATION:	01
TAPE ADVANCE:	24 HRS
REALTIME AVG:	1 MIN
EDIT	OK

- Tape advance period and real time averaging period varies by user.

Software Setup

- The next screen is the E-BAM machine type start-up screen.

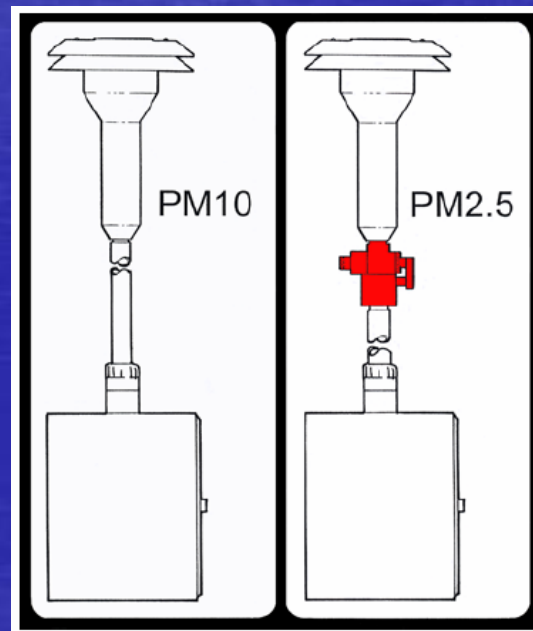
A screenshot of a software interface with a white background and a black border. The text is in a monospaced font. It displays 'MACHINE TYPE: PM2.5' on the first line, '< SEE PICTURE' on the second line, and two options, 'EDIT' and 'OK', on the third line.

MACHINE TYPE: PM2.5
< SEE PICTURE
EDIT OK

- The machine type setting is used to tag the data, logged within the unit, as being from either a PM_{2.5} or PM₁₀ machine.

Software Setup

- On that same screen, the SEE PICTURE display refers the user to the different inlet heads as shown in the photograph below.



Software Setup

- Nozzle packing material warning screen.

PLEASE REMOVE
NOZZLE PACKING
MATERIAL.
CONTINUE

- The nozzle-packing material is also the zero calibration plate.

Software Setup

- The next screen is the check filter tape start-up screen.

CHECKING FOR
LOADED TAPE.

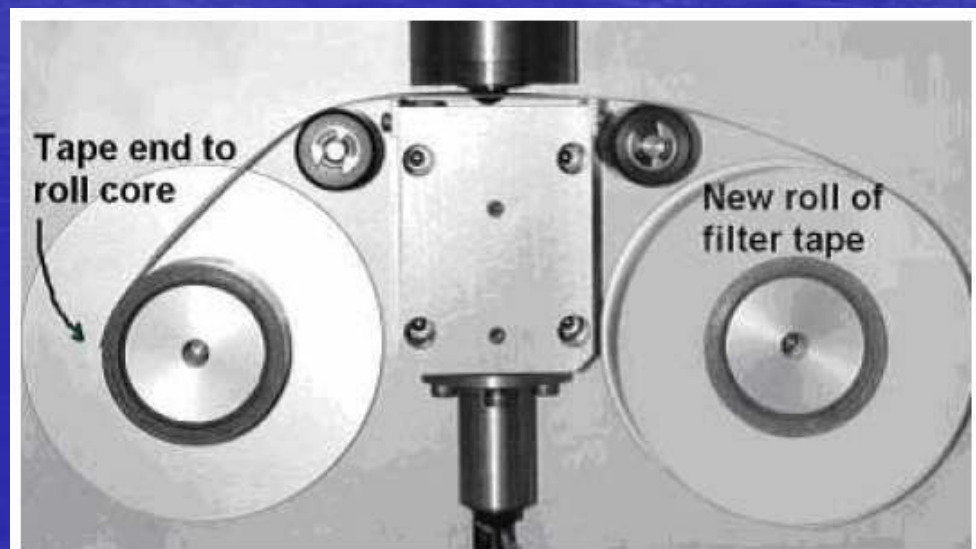
PLEASE WAIT...

- If filter tape is not loaded, the following screen will ask you to load the filter tape.

PLEASE LOAD TAPE!
E-BAM WILL NOT
OPERATE WITHOUT
TAPE. CONTINUE

Filter Tape Installation

- Place a full roll of filter tape on supply (right) spool, with the tape feeding upward and counter-clockwise.
- Feed end of filter tape so that it enters the take-up spool in a counter-clockwise direction. Using adhesive tape, attach the leading end of the filter tape to the core tube to prevent slipping.
- Gently tension the tape. Reinstall both spools. When finished, answer CONTINUE. The filter tape will move and take up tension.



Software Setup

- After the filter tape is checked, the BATTERY condition is displayed in the power start-up screen, as shown below. Press CONTINUE to proceed.

```
BATTERY: 13.0 VOLTS  
ESTIMATED OPERATION  
TIME FOR 100 AMP-HRS  
IS 42 HRS.  CONTINUE
```

Software Setup

- The next screen is the SELF TEST display.
- After SELF TEST is complete, the following screen is displayed. Press CONTINUE and the E-BAM will display the START OPERATION screen.

SELF TEST RUNNING...

*****999

SELF TEST COMPLETE:
E-BAM FUNCTIONING
PROPERLY.
CONTINUE

Possible Errors During Self Test

- Tape Broken
- Nozzle Motor Failed
- Beta Counts Failed
- Flow System Failed
- Pressure Sensor Failed

Software Setup

- If no faults were located during the Self Test and CONTINUE was selected, the E-BAM will display the START OPERATION screen.

WARNING	
START OPERATION?	
MENU	YES

Operation

- During normal operation, the OPERATE SCREEN will come on and display the following:

```
08-JUL-2001 08:23:41
  9.999 MG/M3  01:00
  9.999 MG/M3  (HR)
SAMPLING...
```

```
FLOW:  99.9 LPM
```

```
WS:  999.9 M/S
```

```
WD:  999.9 DEG
```

```
AT:  -99.9 C
```

```
FT:  -99.9 C
```

```
RHi:   999 %
```

```
RHx:   999 %
```

```
BV:   99.9 V
```

```
FLOW:  99.9 SLPM
```

Operation

- The lines in the operating screen consist of the following information:
- A review of all operating settings can be found in Section 4.1 of operational SOP.

Line	Description
1	Date and Time
2	Real-Time Concentration
3	Hourly Concentration
4	E-BAM Status
5	Sample Flow Rate
6	Wind Speed
7	Wind Direction
8	Ambient Temperature
9	Filter Temperature
10	Relative Humidity Internal
11	Relative Humidity External
12	Battery Voltage
13	Secondary Flow

Self Test

- The E-BAM has a SELF TEST mode that will automatically test all parameters. The SELF TEST will take several minutes and cannot be bypassed by the operator.
- After SELF TEST is finished, the following screen is displayed.

OPERATE LOAD TAPE SETUP MEMORY
SELF TEST FIELD CALIBRATION SHUTDOWN/SHIPPING VIEW ALARM LOG ABOUT

SELF TEST COMPLETE: E-BAM FUNCTIONING PROPERLY. CONTINUE

Self Test

- If SELF TEST failed then, depending upon the error, either the HARDWARE FAILURE screen or LOAD TAPE screen is shown.

A screenshot of a computer screen displaying a warning message. The text is arranged in three lines: "WARNING" on the first line, "HARDWARE FAILURE" on the second line, and "CONTINUE" on the third line. The text is in a monospaced font and is centered within a white rectangular box that has a thin black border.

WARNING
HARDWARE FAILURE
CONTINUE

- Pressing CONTINUE on the HARDWARE FAILURE screen loads the alarm log, which displays the corresponding hardware failure.

Self Test

- Pressing CONTINUE on the LOAD TAPE screen causes the system to attempt to detect tape. If tape is found and the SELF TEST was entered from the start-up, the start operation screen is shown. If tape is found and the SELF TEST was entered from the main menu, the main menu screen is shown. If no tape is found, the screen is not changed.

```
PLEASE LOAD TAPE!  
E-BAM WILL NOT  
OPERATE WITHOUT  
TAPE.          CONTINUE
```


Calibration

- Calibration of the E-BAM is done using the same calibration standard used for the calibration of BAM-1020.

OPERATE LOAD TAPE SETUP MEMORY
SELF TEST FIELD CALIBRATION SHUTDOWN/SHIPPING VIEW ALARM LOG ABOUT

Calibration

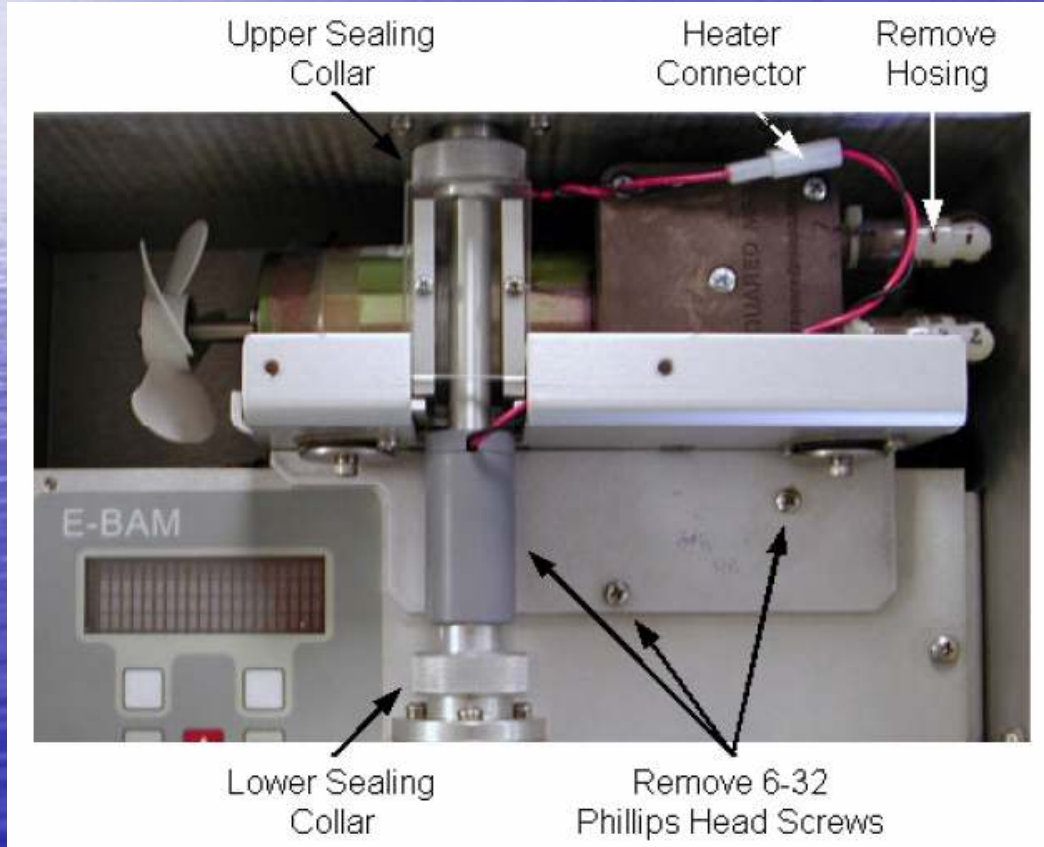
- Each FIELD CALIBRATION test is thoroughly explained in Sections 6.2.2 through 6.2.5 of the operational SOP and includes a review of:
 - 6.2.2 Flow Audit/Calibration
 - 6.2.3 Membrane Test
 - 6.2.4 Inlet Heater Maintenance
 - 6.2.5 Pump Test

Troubleshooting Guide

Symptom	Probable Cause	Remedy
Low or no 12 Volt DC power	Bad battery, discharged battery, bad connection	<ol style="list-style-type: none"> 1. Test battery. 2. Charge or replace if necessary. 3. Clean battery connections. 4. Replace power cable.
Pump will not start	Bad pump	<ol style="list-style-type: none"> 1. Check pump and replace if bad. 2. Lift nozzle and check for obstruction in flow path.
Flow rate is too low	Air leak, bad pump, obstruction in air path	<ol style="list-style-type: none"> 1. Check for an air leak. 2. Check pump and replace if bad.
No filter tape movement	Bad motor/drive	<ol style="list-style-type: none"> 1. Replace the motor/drive unit.
Filter tape slips	End of tape is slipping on take up spool	<ol style="list-style-type: none"> 1. Tape end of filter tape to the take up spool.
Filter tape is being cut by the nozzle	Debris under nozzle	<ol style="list-style-type: none"> 1. Lift nozzle and clean off debris.
Nozzle does not move	Bad motor or limit switch	<ol style="list-style-type: none"> 1. Replace the motor or limit switch.

Maintenance

- Pump replacement instructions are located in 6.2.5.2 of operational SOP.

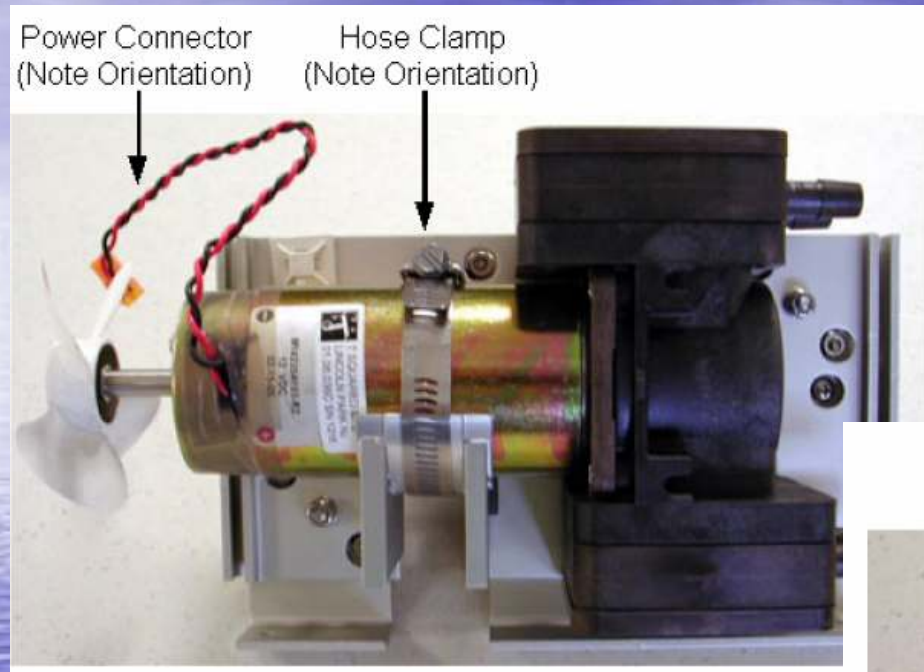


Removing the
Pump for
Replacement

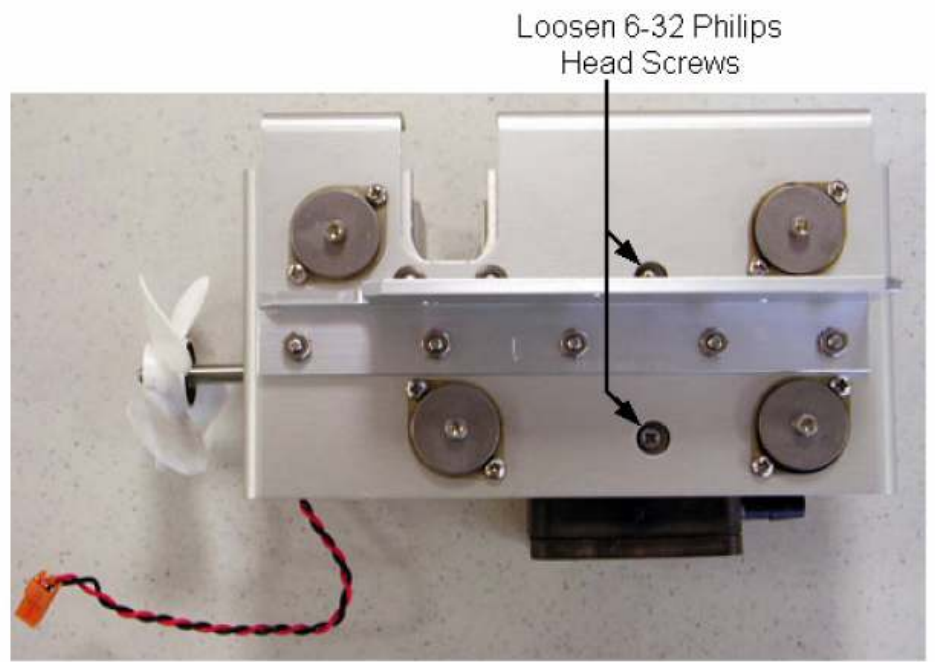
Maintenance

- Refer to Section 7.0 of the operational SOP for a maintenance schedule and instructions for conducting maintenance on the following:
 - Alarm Log
 - Clean the PM₁₀ Inlet Head
 - Clean the PM_{2.5} SCC
 - Filter Tape
 - Clean the PMT

Pump Bracket Assembly



Pump Bracket Assembly Upside Down



Data Retrieval

- Retrieval of data from the E-BAM can be done a number of ways:
 - Front screen viewing of stored data.
 - Communication with any terminal program (e.g., Windows HyperTerminal) allows for the direct download of data directly to a personal computer (PC) or laptop.
- For details, refer to Section 9.0 of the operational SOP.

Data Retrieval

- Another way to retrieve data is to utilize the AIRSIS remote satellite telemetry system to transmit data from the E-BAM using the AQEB-2000 satellite modem to the AIRNow Website.
- Satellite modem setup instructions are located in Section 9.0 of the operational SOP.



E-BAM User Assistance

- E-BAM user area available to operators on Met One website: http://www.metone.com/ebam_user.asp
Username: E-Bam or e-bam
Password: metone
- User area contains most recent E-BAM Operation Manual (Revision J), including the latest software upgrades, and explains how to tag the unit either as PM₁₀ or PM_{2.5}.
- Operators should have E-BAM firmware version 1.50 or 1.50.1. For the latest version of firmware, please contact Mike Putnam at the Met One service department at 541-471-7111 in order to arrange getting the latest upgrade. This upgrade cannot be completed in the field.

Things to Remember...

- E-BAM screens are a little different in the older version vs. the newer version. There can also be the option of future changes when we need to make an improvement. Different E-BAM models will be similar, but not always exactly the same.
- Terminal Utility Software (TUS) is no longer available on the E-BAM. Met One has developed a new program called ComMet. A free copy of ComMet can be downloaded at the following link:
<http://metoneftp.com/Service/ComMetBeta/ComMet.exe>

3. AIRSIS Remote Satellite Telemetry System

Topics covered in this section:

- Background
- Satellite Modem Setup
- Troubleshooting Guide
- Data Retrieval

Background

- Provider of remote satellite telemetry system is AIRSIS.
- E-BAM monitors require AIRSIS Monitor model AQEB-2000.
- Point of Contact: Cole Morton, Project Manager, cmorton@airsis.com; 619-585-0434.
- For questions or technical support, contact AIRSIS at 619-585-0435 between 8:30am and 5:00pm PST, or send e-mail to support@airsis.com.



Satellite Modem Setup



AIRSIS Monitor Mounted on E-BAM

- It is recommended that you charge your AIRSIS satellite modem's internal battery for a full day before deployment.

Satellite Modem Setup

Shot of the top of the modem with antenna attached



- For reliable communications, it is important that the antenna is properly connected and has a clear view of the sky. The AIRSIS Monitor will typically communicate well even if there is some foliage overhead. However, metal roofs and other man-made structures will typically result in unreliable communications.

Satellite Modem Setup

Shots of the LED display and
AQEB-2000 interior faceplate



Satellite Modem Setup



Close-up of the
bottom of the E-BAM
plug in ports



...with the
cables attached

Troubleshooting Guide

Problem	Solution
Serial data cable will not plug in.	<ol style="list-style-type: none">1. Make sure that there is no debris in either the cable connector or receiver.2. Confirm pin count and proper port location.3. Check for bent pins. If pins are bent or broken, contact AIRSIS.
No lights appear on AIRSIS Monitor.	<ol style="list-style-type: none">1. Charge battery (minimum 6 hours).2. If battery is charged, check battery cables for secure connection.
System lights appear to function, and then all go out at once. This repeats continuously.	<ol style="list-style-type: none">1. Charge battery (minimum 6 hours).2. If battery is charged, check battery cables for secure connection.

Problem	Solution
<i>Logger or Digital</i> light does not illuminate.	<ol style="list-style-type: none"> 1. Ensure that both the AIRSIS Monitor and connected instrument are powered on. 2. Ensure that data cable is plugged in. 3. Confirm that environmental instrument is correctly configured to output data.
<i>Satellite Link</i> light does not illuminate.	<ol style="list-style-type: none"> 1. Ensure that antenna is firmly attached to its mounting location. 2. If your unit has a magnetic mount antenna, make sure the cable has not been damaged. 3. Ensure that the antenna has a clear view of the sky, with minimal obstructions to the horizon and sky.
Data on website is incomplete or inaccurate.	<ol style="list-style-type: none"> 1. Make sure environmental instrument is configured correctly.
AIRSIS Monitor does not appear on the Interagency web site.	<ol style="list-style-type: none"> 1. Wait 20 minutes after installation and attempt to view your unit on the web site. If your unit is not displayed and you have evaluated all of the above remedies, contact AIRSIS.

Data Retrieval

- Temporary AIRSIS data logging system can be viewed at this link:

<http://epa.airsis.com/track/login.aspx?ReturnUrl=%2ftrack%2fdefault.aspx>

User Name: epa

Password: epa_01

Data Retrieval

Example Data Display on AIRSIS Website

EPA Monitoring System											
Thu Sep 28 21:35:19 2006											
Current Status Unit Locations Map Administration Export Data: Excel User Guide Log off											
Current Status											
Alias	Date/Time	Location	Voltage	Data Time (GMT)	ConcRT (mg/m3)	ConcHr (mg/m3)	Flow (l/m)	WS (m/s)	WD (Deg)	AT (C)	RH (%)
MMNM10001	9/27/06 5:41AM	795 Alta Vista St, Santa Fe, NM 87505	12.97	Type	Type	Type	Type	Type	Type	Type	Type
MMOAQ0003	2/2/06 6:44PM	Jefferson Hwy, New Orleans, LA 70121	12.74								
MMOAQ0014	2/2/06 7:14PM	5741 Powell St, New Orleans, LA 70123	12.82								
MMOAQ0016	9/3/05 12:55AM	4576 N 17th Ave, Phoenix, AZ 85015	13								
MMOAQ0103	2/2/06 7:00PM	8863 Belfast St, New Orleans, LA 70118	12.65								
MMOAQ0114	1/4/06 1:05PM	8924 US-90, New Orleans, LA 70118	12								
MMOAQ0116	6/21/06 3:47PM	22 F St, Nenana, AK 99760	13.51	Type	Type	Type	Type	Type	Type	Type	Type
MMOAQ0120	1/7/06 3:59PM	3521 Kenneth St, Metairie, LA 70002	12								
STEP10001											
STID10001	8/30/05 4:30PM	Popkroll Way, Idaho Falls, ID 83401	13								
STNV10001	8/5/05 6:33PM	6, Chula Vista, CA 91911	12								
STOR10001	9/28/06 8:45PM	5864 SE Lafayette St, Portland, OR 97206	13.52	Type	Type	Type	Type	Type	Type	Type	Type
STWA10001	8/19/05 9:37AM	S Charlestown St, Seattle, WA 98108	10								
Current Status Unit Locations Map Administration Export Data: Excel User Guide Log off											

4. AIRNow-Tech (EPA and Sonoma Technology)

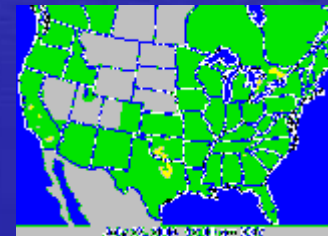
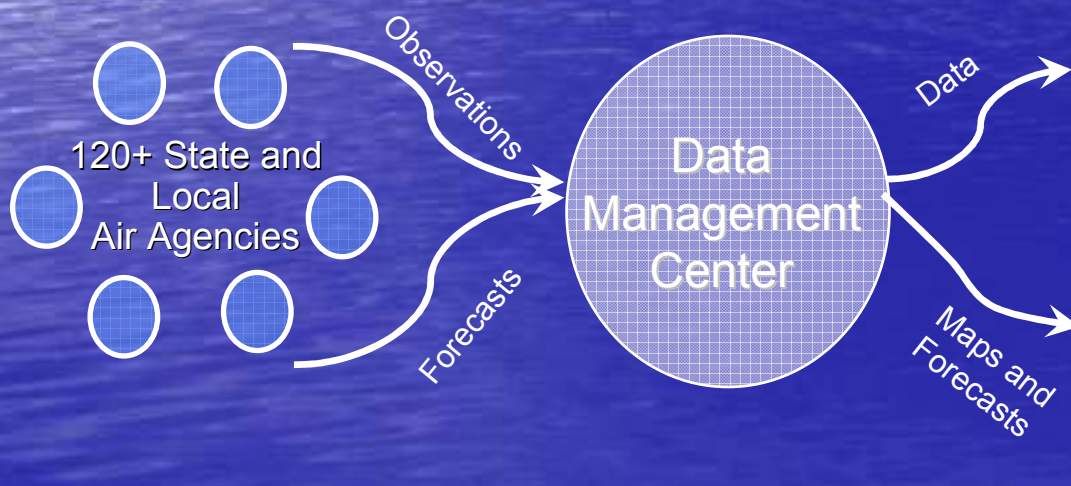
Topics Covered in this Section

- Background
- Data Flow
- Features of AIRNow-Tech
- Items to Consider

Background



- AIRNow
 - Centralized, nationwide system
 - Main purpose – to provide data to public (AQI)
 - 120+ federal, state, provincial, tribal, and local air agencies participate
 - Real-time products (maps, data feeds, forecasts)

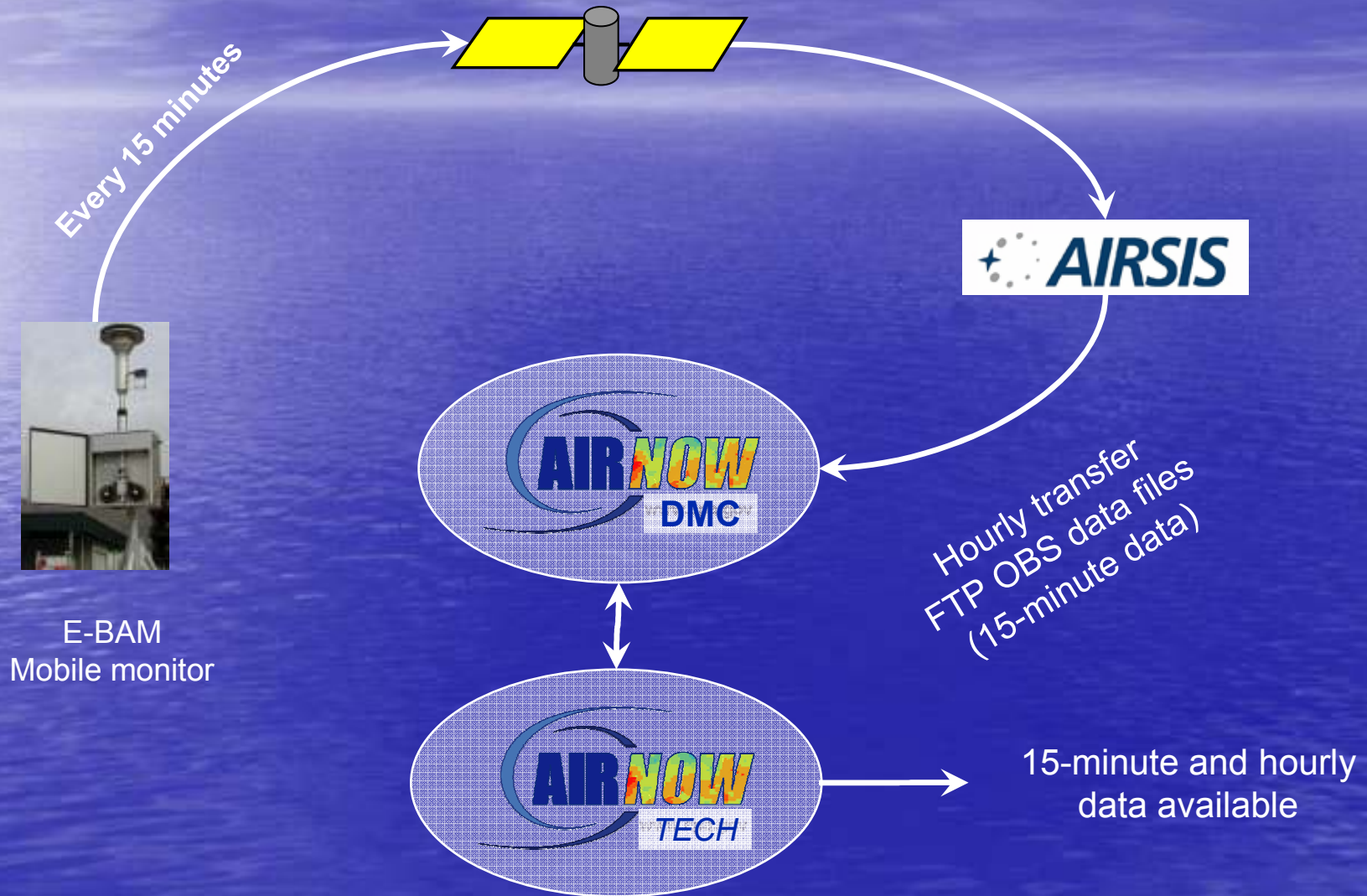


Background

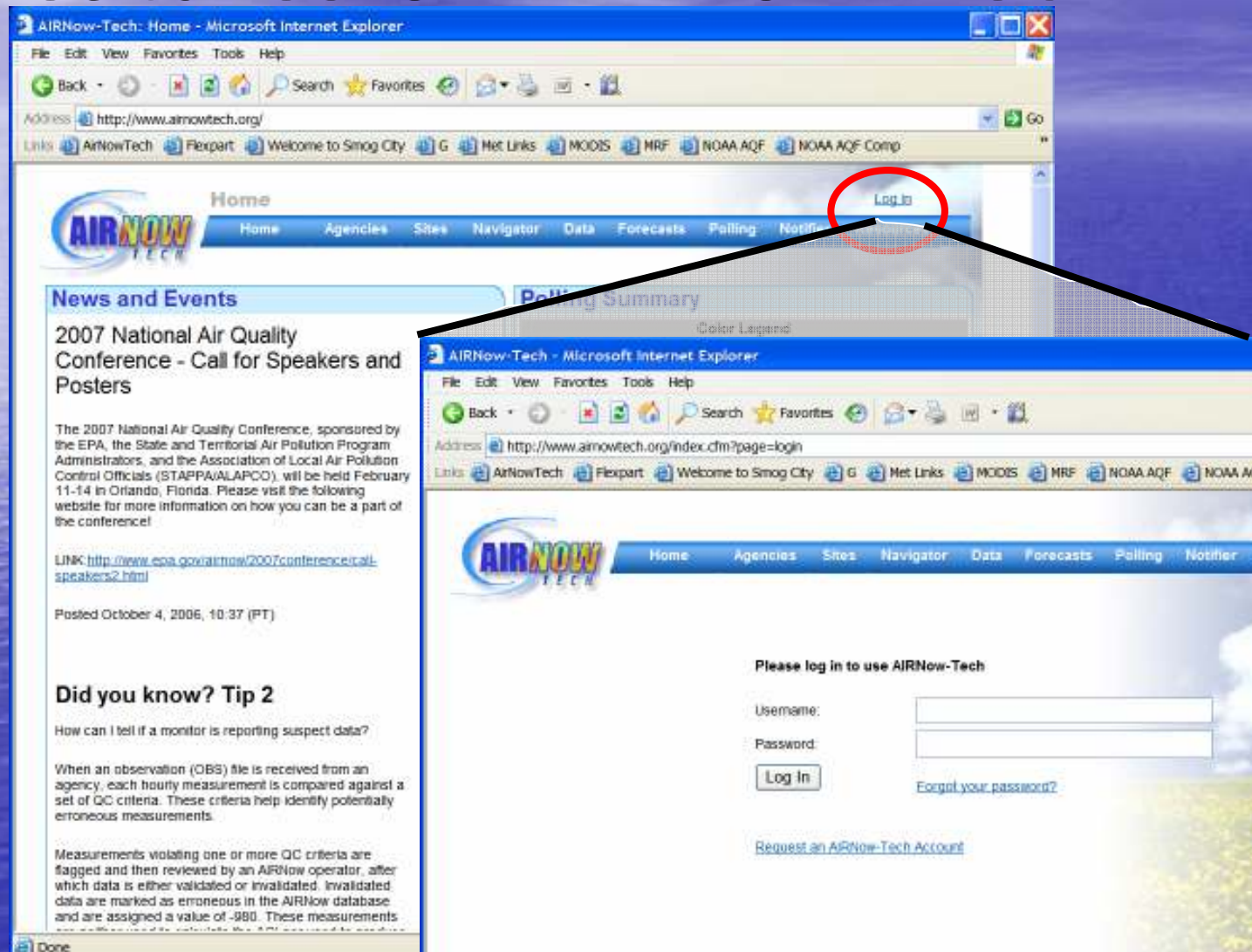


- AIRNow-Tech
 - Allows access to the AIRNow Data Management Center (DMC)
 - Interactive web-based data management and analysis tools
 - Password-protected with individual user accounts
 - Benefits
 - Integrate with other air quality data
 - Use several interactive data analysis and display tools
 - Share data with public/media (when approved)
 - Download data from many sites

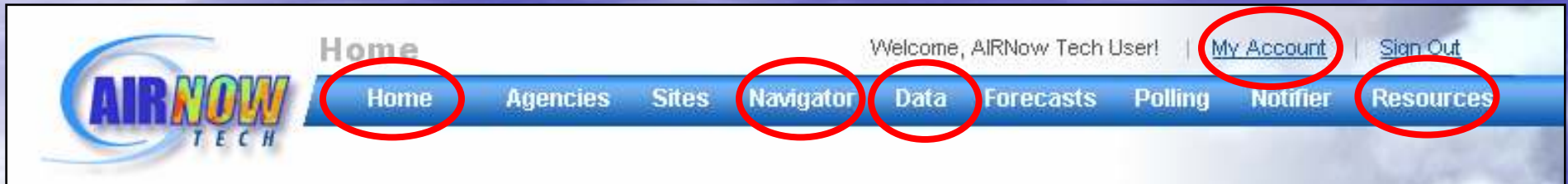
Data Flow



Features of AIRNow-Tech



Features of AIRNow-Tech



- **Home** – Relevant news, events, and snapshot of agency status
- **Navigator (GIS)** – Monitor maps, current and historical air quality and meteorological data display, HYSPLIT trajectory tool, numerous supporting GIS layers
- **Data** – Hourly, daily, and historical monitoring data queries
- **Resources** – General information for AIRNow program and the Data Management Center (DMC)
- **My Account** – Account management, customizable preferences, and tools

Features of AIRNow-Tech

- Site names in AIRNow-Tech
 - Sites use AQS codes in AIRNow (Ex. 010890014)
 - Temporary or mobile monitors use different site codes
 - STaaannnn – short-term monitors
 - MMaaannnn – mobile/moving monitors
 - aaa=agency id in AIRNow (CA1, NV1)
 - nnnn=number
 - AIRNow DMC assigns numbers and communicates them to AIRSIS

Features of AIRNow-Tech

- Data queries (hourly and 15-minute data)

Sub-hourly Data Queries

Choose site:

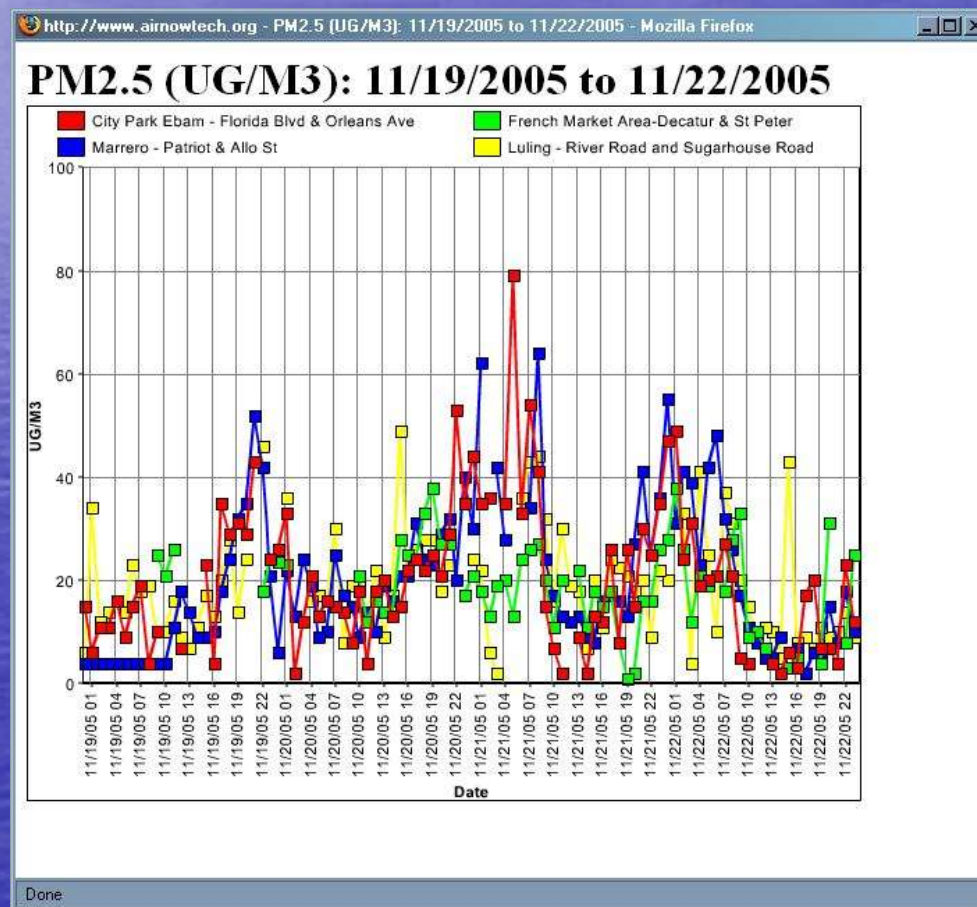
Choose date(s): to

1528 Records Returned

Agency	Site Name	AQS Code	Date/Time	Value
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 00:00	47
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 00:15	42
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 00:30	30
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 00:45	18
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 01:00	85
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 01:15	18
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 01:30	22
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 01:45	12
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 02:00	144
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 02:15	23
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 02:30	33
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 02:45	27
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 03:00	22
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 03:15	17
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 03:30	30
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 03:45	84
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 04:00	39
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 04:15	-5.0
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 04:30	22
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 04:45	9
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 05:00	51
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 05:15	57
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 05:30	-1.0
QAQ	City Park Eblam - Florida Blvd & Orleans Ave	STOAG0001	12/1/05 05:45	41

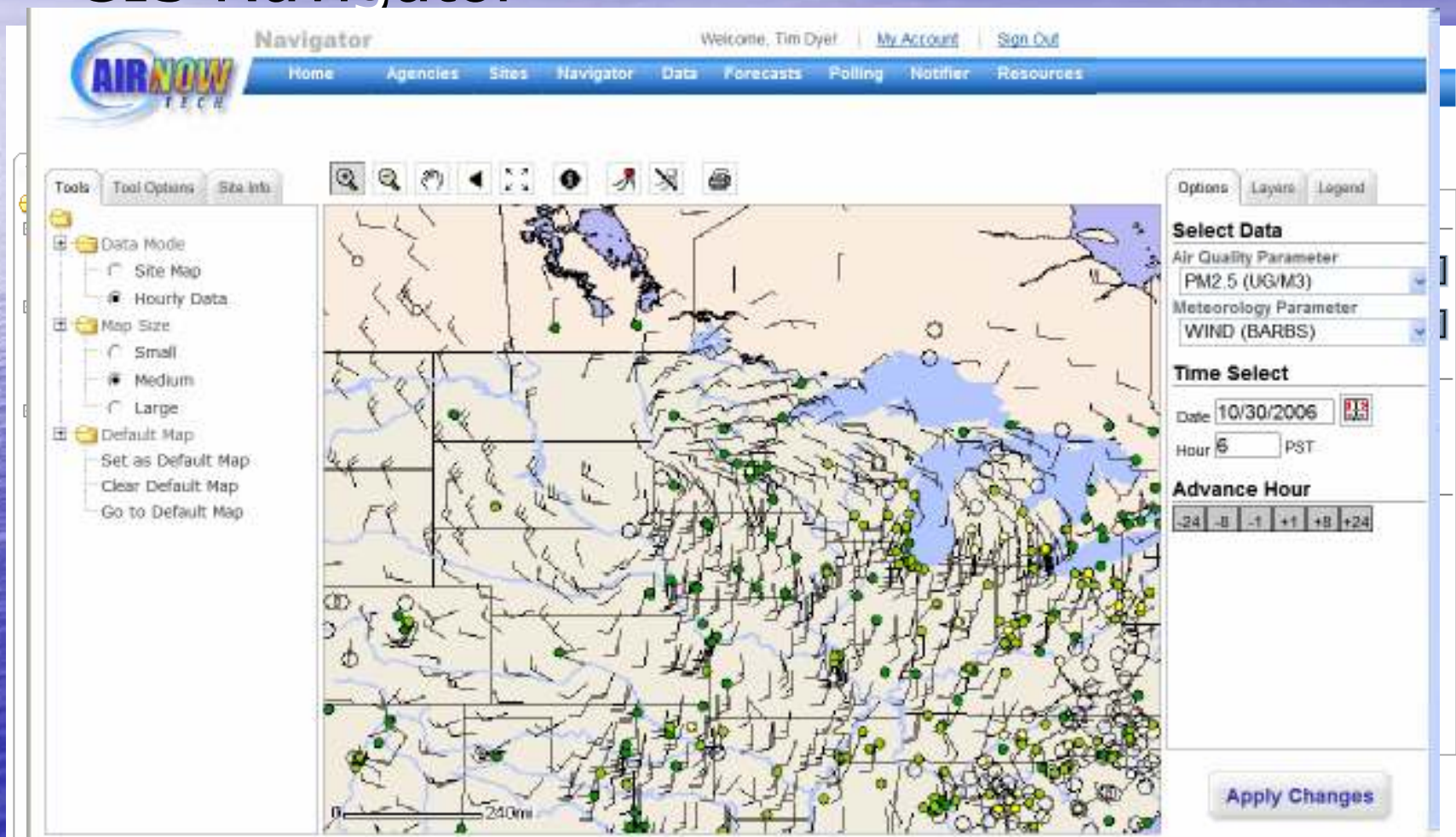
Features of AIRNow-Tech

- Data queries (hourly and 15-minute data)

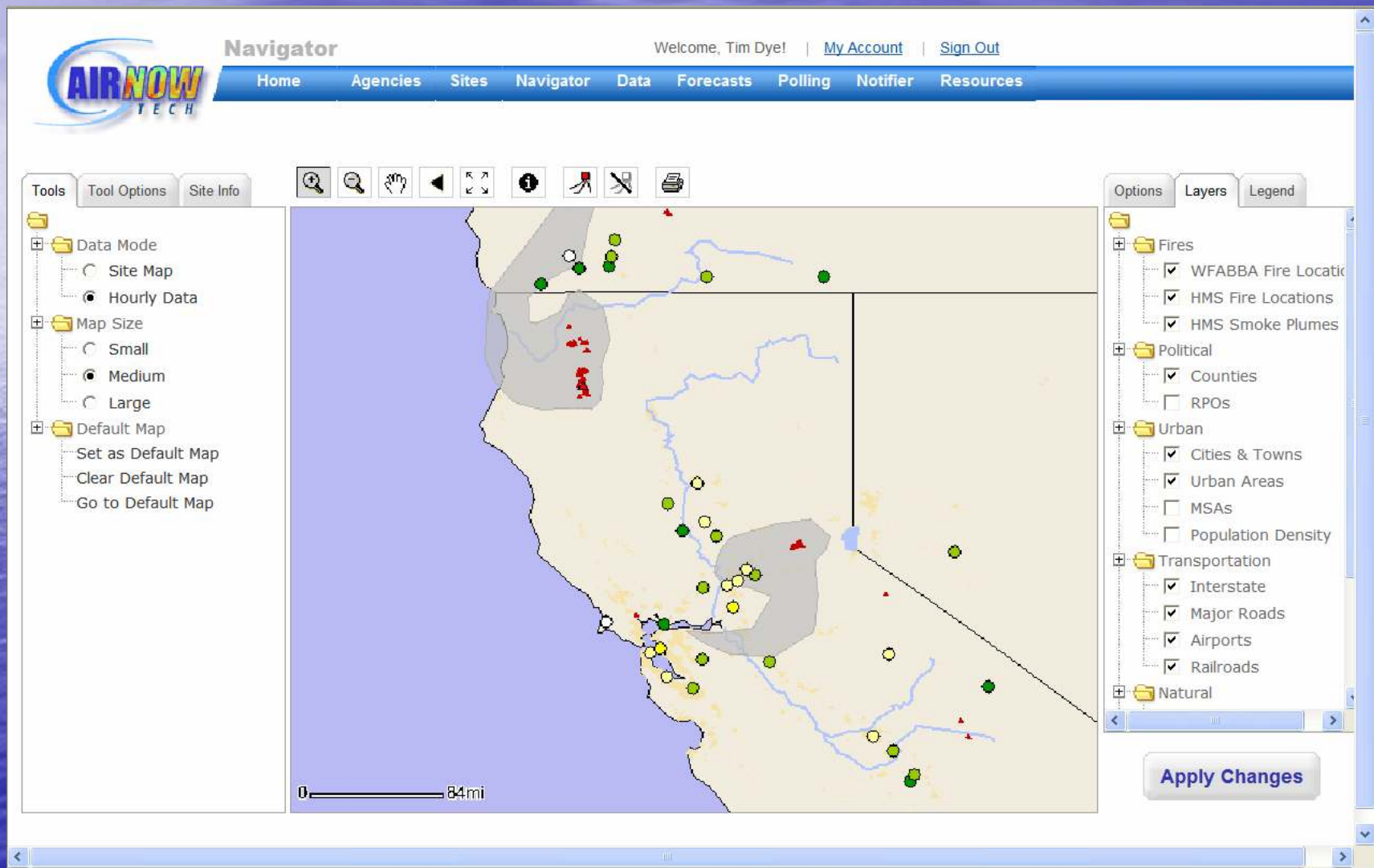


Features of AIRNow-Tech

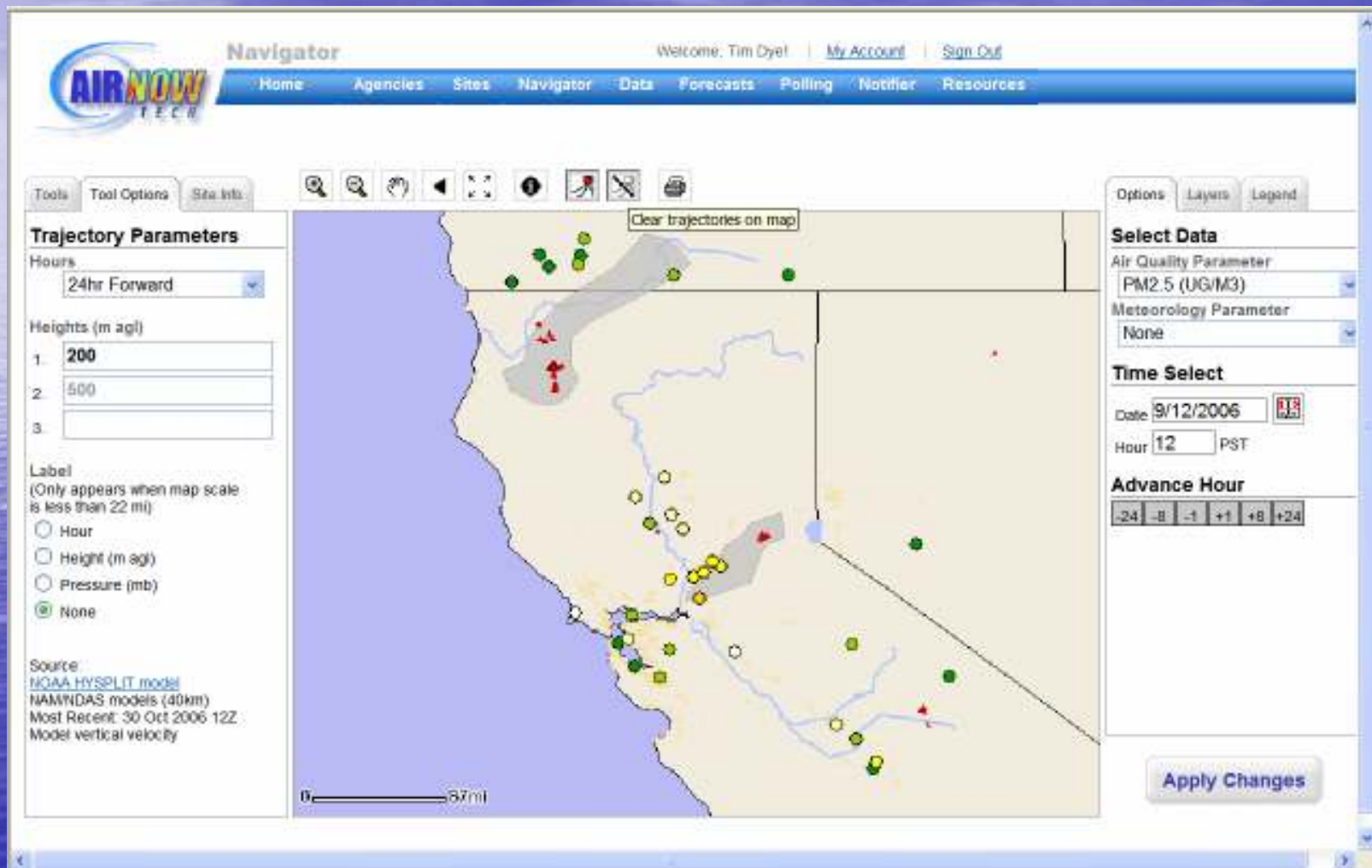
- GIS Navigator



Features of AIRNow-Tech



Features of AIRNow-Tech



Items to Consider

- Get an AIRNow-Tech account
- Routinely send in data – always in a standby mode
- Notify the AIRNow DMC when an instrument is deployed
- Decide whether to release data to the public

Features of AIRNow-Tech

More information on AIRNow-Tech

Talk by Phil Dickerson/EPA

"AIRNow-Tech: An interactive web-based data management and analysis tool supporting the AIRNow air quality notification and forecasting system"

Wednesday afternoon

4:45 PM in the

Web Access and Data Reporting Session

Resources and contacts



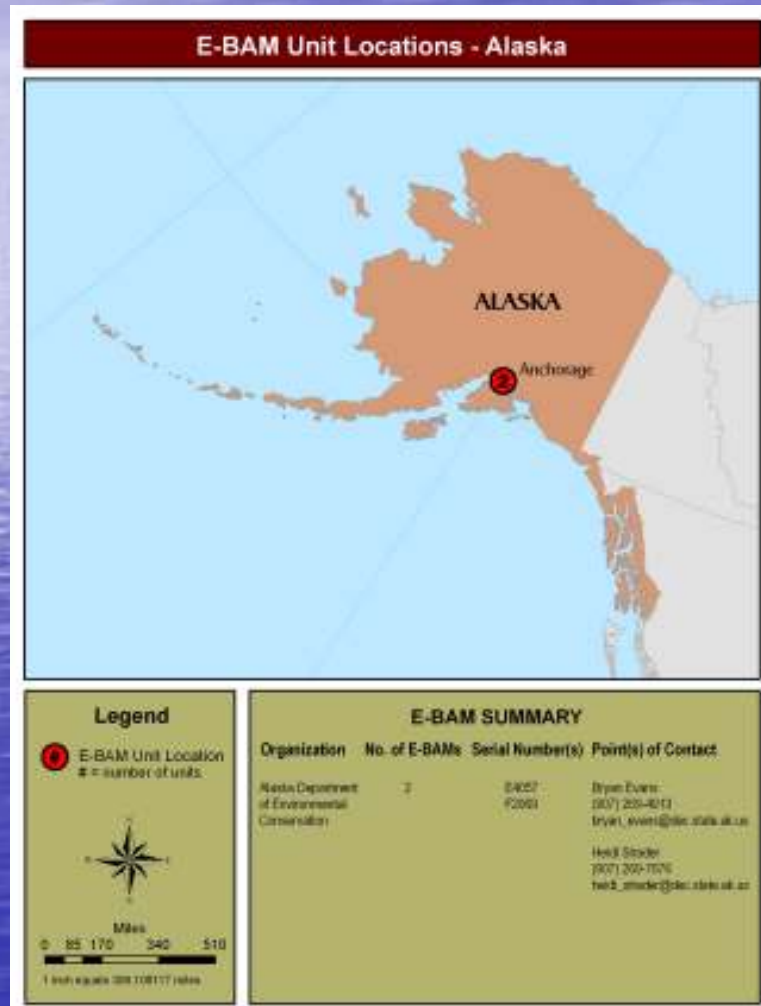
- Available at www.airnowtech.org
- Request an account
 - (www.airnowtech.org/signup)
- For more information, contact the AIRNow DMC
 - (707) 665-9900 or
 - airnowdmc@sonomatech.com
- Access to 15-minute data:
www.airnowtech.org/SubHourlyData.cfm

5. E-BAM Inventory and Stakeholder Contact List

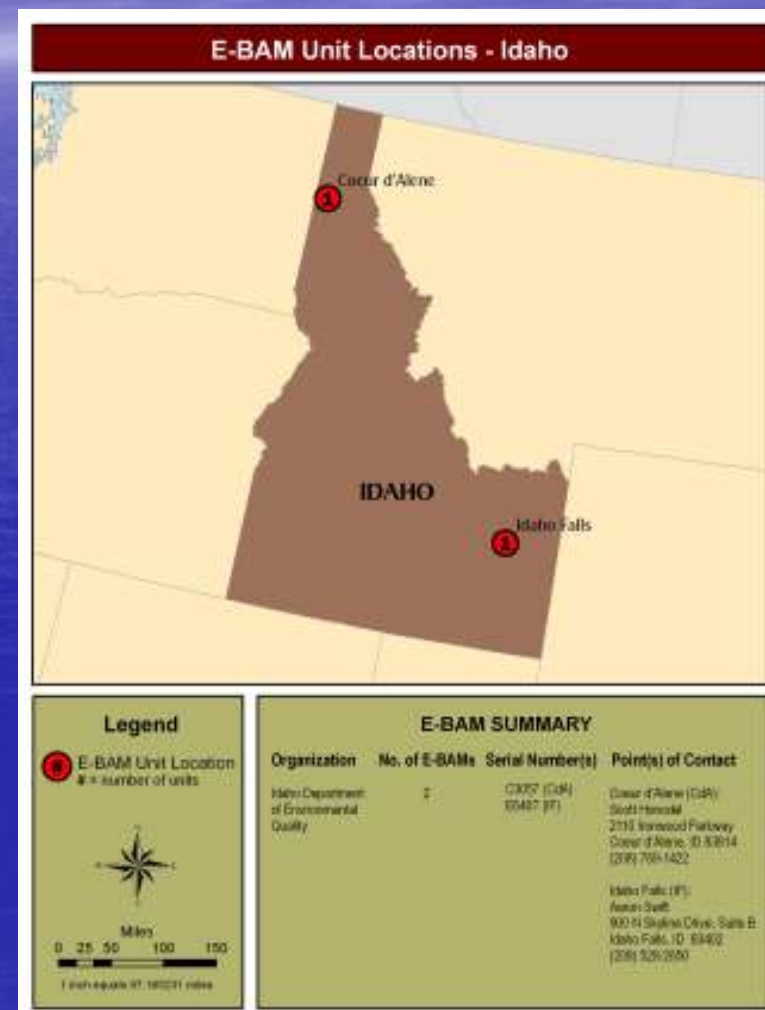
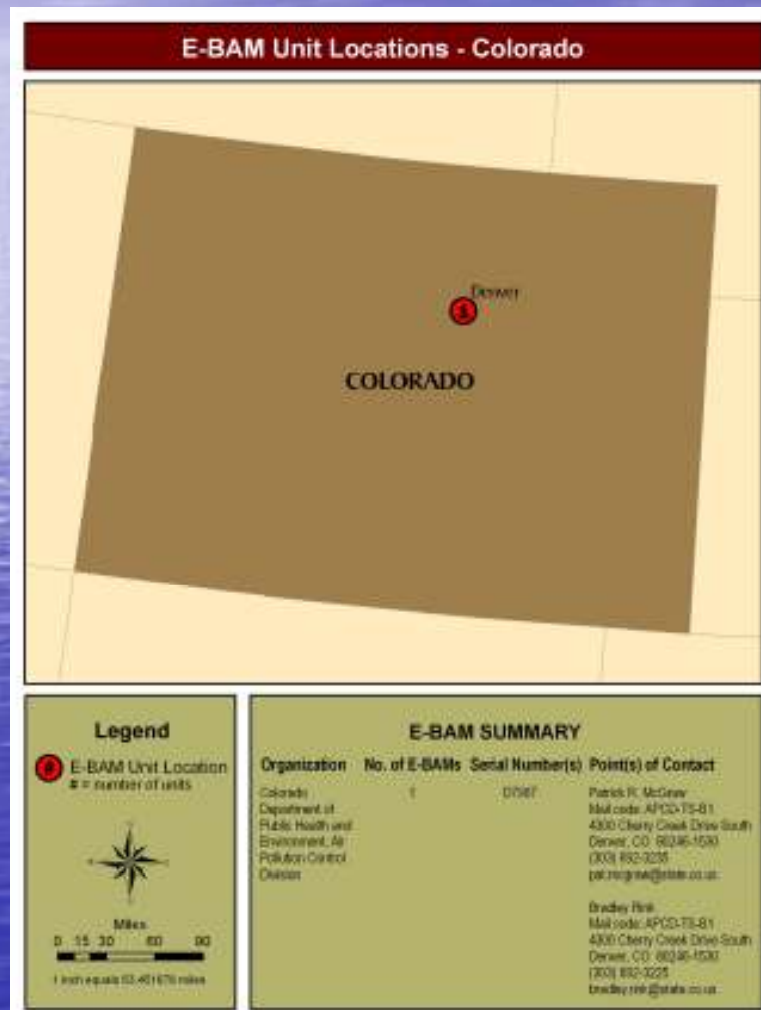
Topics presented in this section:

- The E-BAM inventory maps list monitors by state, organization, and detailed contact information.
- See tables at the end of the PowerPoint training package, entitled:
 - E-BAM Inventory Contact Information
 - Wildfire Smoke Monitoring Workgroup Contact List

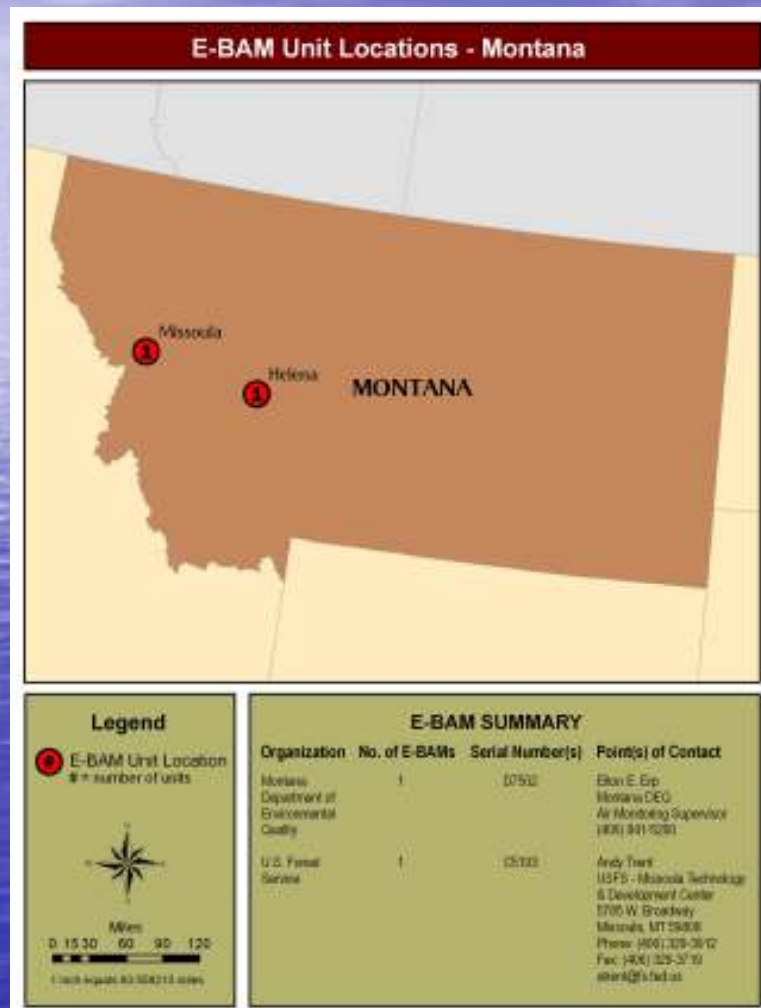
Alaska, California



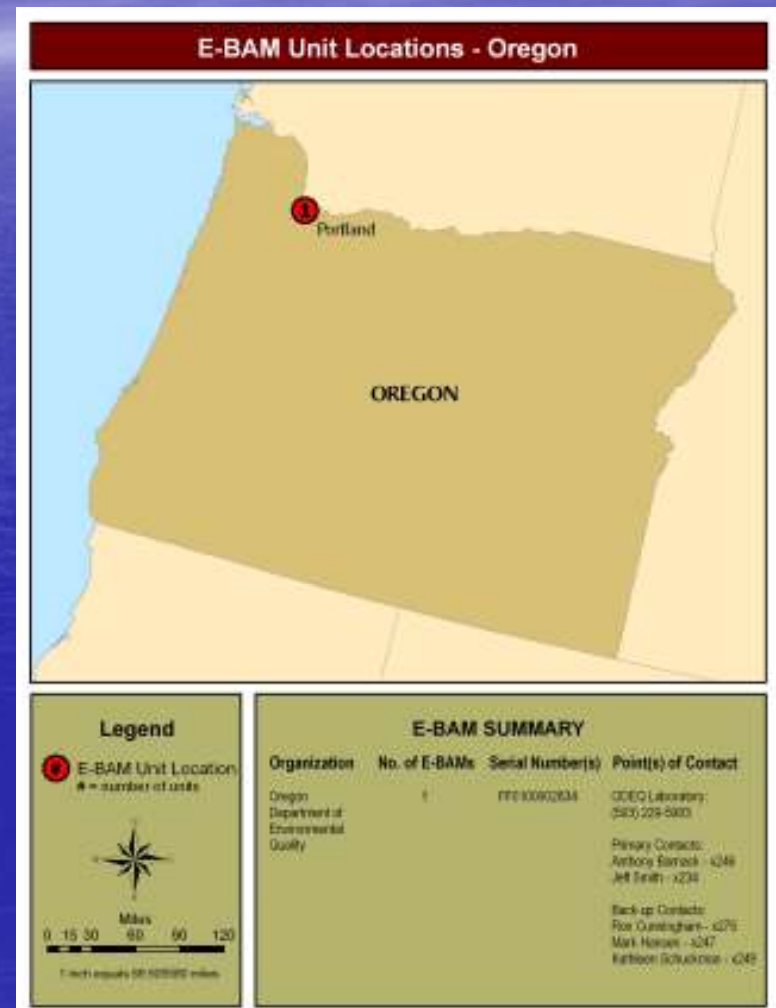
Colorado, Idaho



Montana, Nevada



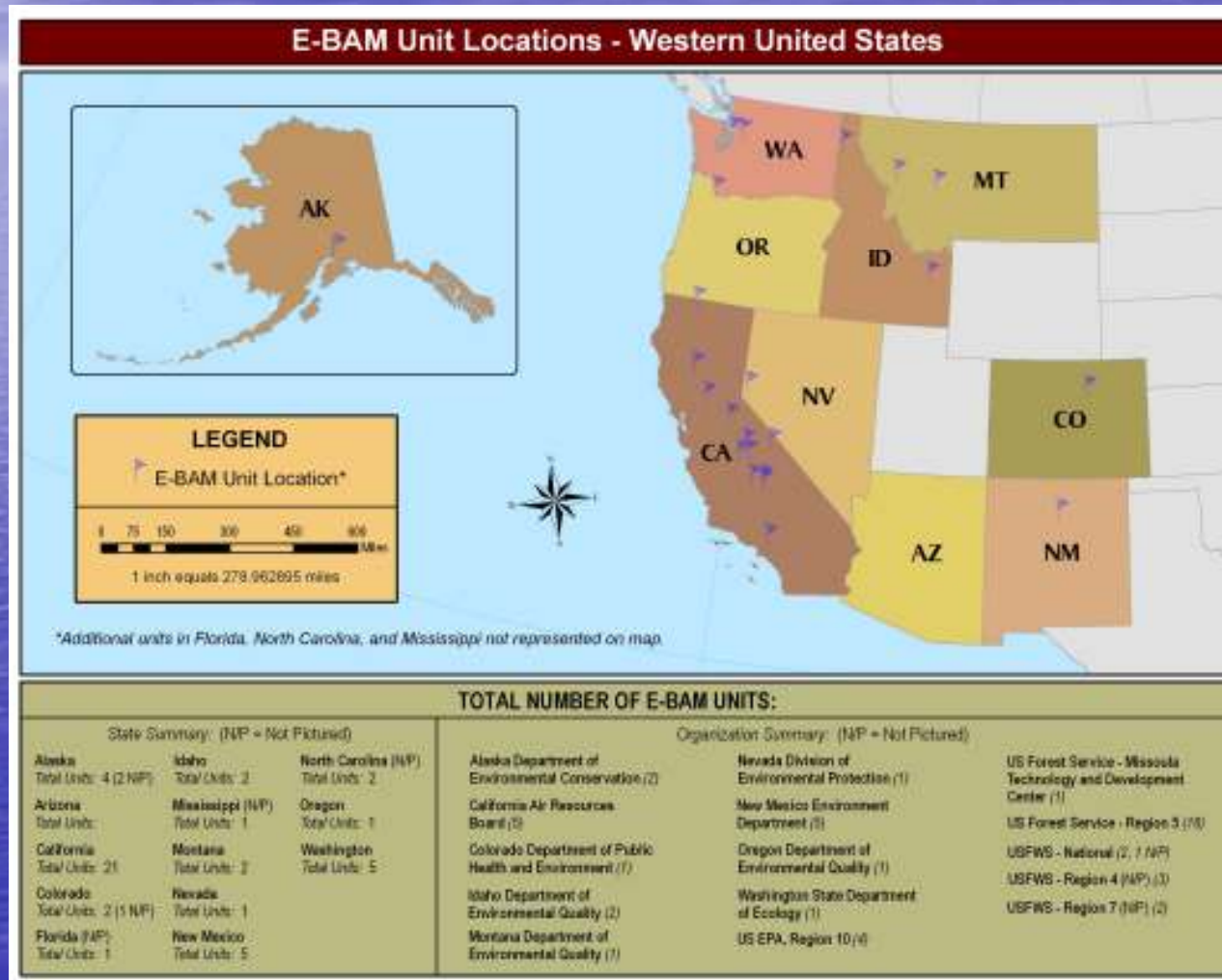
New Mexico, Oregon



Washington



Summary - Western United States



6. Additional Reading Materials

Topics covered in this section:

- References to Previous Studies in this Area
- Useful Websites

References to Previous Studies in this Area

- California Air Resources Board. Review of the Ambient Air Quality Standards for Particulate Matter and Sulfates (2002). Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates May 3, 2002. Accessed September, 2004. Available at: <ftp://ftp.arb.ca.gov/carbis/research/aaqs/std-rs/pm-final/app5.pdf>.
- California Air Resources Board. Review of the California Ambient Air Quality Standards For Particulate Matter and Sulfates.(2001). Report to the Air Quality Advisory Committee, November 30, 2001. Accessed September, 2004. Available at: <http://www.arb.ca.gov/research/aaqs/std-rs/pm-draft/ch5-app-G.PDF>.
- Chung, A, Chang, D.P.Y., Kleeman, M.J., Perry, K.D., Cahill, T.A., Dutcher, D., McDougall, E.M., and Stroud, K., Comparison of real-time instruments used to monitor airborne particulate matter. J. Air and Waste Management Association, Vol. 51, pg.109-120 (2001).
- Dutcher D, Chung A, Kleeman M, Miller A, Perry K, Cahill T, Chang D. Instrument intercomparison study Bakersfield, CA, 1998-1999. Final report. Prepared for California Air Resources Board, Contract number 97-536, Delta Group, Department of Civil Engineering, University of California Davis and Department of Meteorology, San Jose State University.
- Trent, A . 2003. Laboratory Evaluation of Real-Time Smoke Particulate Monitors. 0325 2834. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center.

References to Previous Studies in this Area (*contd.*)

- Trent, A; Davies, M.A.; Karsky, D; Fisher, R. 2001. Real-Time Smoke Particulate Sampling: Fire Storm 2000. 0125 2832. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center.
- Trent, A; Davies, M.A.; Karsky, D; Fisher, R; Thistle, H.W.; Babbitt, R. 2000. Evaluation of Optical Instruments for Real-Time Continuous Monitoring of Smoke Particulates. 0025 2860. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center.
- Trent, A; Thistle, H. W.; Fisher, R; Babbitt, R; Holland-Sears, A. 1999. Laboratory Evaluation of Two Optical Instruments for Real-Time Particulate Monitoring of Smoke. 9925-2806P. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center.
- Watson, J.G.; Chow, J.C.; Bowen, J.L.; Lowenthal, D.H.; Hering, S.V.; Ouchida, P.; Oslund, W. Air quality measurements from the Fresno supersite; JAWMA 2000, 50(8), 1321-1334.
- Watson, J.G.; Chow, J.C.; Chen, A.; Magliano, K.A.; Ouchida, P.; Countess, R.J., Countess, S. Equivalence and Comparability Among Different PM_{2.5} Mass Measurements in Central California. AAAR Annual Meeting, Anaheim, CA. October 22, 2003.

Useful Websites

- Ambient Monitoring Technology Information Center: Wildfire/Smoke Monitoring Documents
 - <http://www.epa.gov/ttn/amtic/smoke.html>
- Ambient Monitoring Technology Information Center: Hurricane Katrina Monitoring Information
 - <http://www.epa.gov/ttn/amtic/sabreview.html>
- Interagency Real-Time Smoke Monitoring: Contact Information
 - <http://www.satguard.com/usfs4/contact.asp>
- USDA Forest Service Technology and Development Program: Remote Telemetry System for Particulate Monitoring
 - <http://www.epa.gov/ttn/amtic/files/ambient/smoke/remote.pdf>

7. Supporting Documentation

Contractor developed documentation located at the end of the PowerPoint training package:

- Operational SOP
- Abridged operational SOP
- Draft analysis report of E-BAM/FRM intercomparisons at NAMS sites